

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

122
Buehler
16. (NEW) Method of operating an internal-combustion engine which has a plurality of first cylinders and at least one second cylinder, the at least one second cylinder serving as an input cylinder, in that a portion of the exhaust gas from the at least one second cylinder is fed by way of an exhaust gas recirculating system to carbureted fuel, said engine also having an injection system for injecting fuel into the first cylinders and into the at least one second cylinder,

said method comprising controlling of the injected fuel quantity of the at least one second cylinder independently of the controlling of the injected fuel quantity of the first cylinders.

17. (NEW) Method according to Claim 16, wherein said controlling of the injected fuel quantity includes independently adjusting at least one of the injection start and the injection duration of the fuel injection for the first cylinders and for the at least one second cylinder.

18. (NEW) Method according to Claim 15, wherein for raising the partial oxygen pressure of the carbureted fuel fed to the first cylinders, the fuel quantity is reduced which is injected into the at least one second cylinder.

19. (NEW) Method according to Claim 17, wherein for raising the partial oxygen pressure of the carbureted fuel fed to the first cylinders, the fuel quantity is reduced which is injected into the at least one second cylinder.

20. (NEW) Method according to Claim 17, wherein together with the reduction of the fuel quantity injected into the at least one second cylinder, the fuel quantity is raised which is injected into the first cylinders.

21. (NEW) Method according to Claim 16, wherein for lowering the partial oxygen pressure of the carbureted fuel fed to the first cylinders, the fuel quantity is increased which is injected into the at least one second cylinder.

22. (NEW) Method according to Claim 17, wherein for lowering the partial oxygen pressure of the carbureted fuel fed to the first cylinders, the fuel quantity is increased which is injected into the at least one second cylinder.

23. (NEW) Method according to Claim 21, wherein together with the increasing of the fuel amount injected into the at least one second cylinder, the start of the injection of the fuel amount into the at least one second cylinder is shifted to late.

Serial No.

24. (NEW) Method according to Claim 22, wherein together with the increasing of the fuel amount injected into the at least one second cylinder, the start of the injection of the fuel amount into the at least one second cylinder is shifted to late.

25. (NEW) Method according to Claim 16, wherein during acceleration operations of the internal-combustion engine, the fuel amount injected into the at least one second cylinder is one of reduced and switched off completely.

26. (NEW) Method according to Claim 17, wherein during acceleration operations of the internal-combustion engine, the fuel amount injected into the at least one second cylinder is one of reduced and switched off completely.

27. (NEW) Method according to Claim 18, wherein during acceleration operations of the internal-combustion engine, the fuel amount injected into the at least one second cylinder is one of reduced and switched off completely.

28. (NEW) Method according to Claim 16, wherein the fuel injection of the at least one second cylinder is switched off in the idling operation of the internal-combustion engine.

0 29. (NEW) Method according to Claim 17, wherein the fuel injection of the at least one second cylinder is switched off in the idling operation of the internal-combustion engine.

0 30. (NEW) Method according to Claim 18, wherein the fuel injection of the at least one second cylinder is switched off in the idling operation of the internal-combustion engine.

0 31. (NEW) Method according to Claim 25, wherein the fuel injection of the at least one second cylinder is switched off in the idling operation of the internal-combustion engine.

32. (NEW) Method according to Claim 16, wherein controlling of the partial oxygen pressure of the carbureted gas fed to the first cylinders takes place as a function of at least one of the following values in the characteristic diagram of the internal-combustion engine operation:

- 102
102
At 17/10/94
- (i) cylinder pressure,
 - (ii) concentration of exhaust gas constituents, particularly NOx, HC, CO,
 - (iii) exhaust gas temperature,
 - (iv) engine torque,
 - (v) fuel usage,
 - (vi) supercharging pressure, and
 - (vii) rotational engine speed.

33. (NEW) Method according to Claim 18, wherein controlling of the partial oxygen pressure of the carbureted gas fed to the first cylinders takes place as a function of at least one of the following values in the characteristic diagram of the internal-combustion engine operation:

- (i) cylinder pressure,
- (ii) concentration of exhaust gas constituents, particularly NOx, HC, CO,
- (iii) exhaust gas temperature,
- (iv) engine torque,
- (v) fuel usage,
- (vi) supercharging pressure, and
- (vii) rotational engine speed.

34. (NEW) Method according to Claim 16, wherein the injection of the fuel takes place by means of a ~~common rail~~ injection system which has a common preliminary storage device for storing highly pressurized fuel and fuel injectors connected with the common preliminary storage device by way of injection lines, for injecting fuel into the cylinders of the internal-combustion engine and a control unit for controlling the fuel quantity fed to the cylinders for the injection, the controlling of the injection of the fuel quantity fed to the at least one second cylinder being carried out by the control unit

Serial No.

independently of the injection of the fuel quantity fed to the
C first cylinders.

09763699-1060104
A1
35. (NEW) Method according to Claim 17, wherein the
injection of the fuel takes place by means of a common rail
injection system which has a common preliminary storage device
for storing highly pressurized fuel and fuel injectors connected
with the common preliminary storage device by way of injection
lines, for injecting fuel into the cylinders of the internal-
combustion engine and a control unit for controlling the fuel
quantity fed to the cylinders for the injection, the controlling
of the injection of the fuel quantity fed to the at least one
second cylinder being carried out by the control unit
independently of the injection of the fuel quantity fed to the
first cylinders.

0
36. (NEW) Method according to Claim 18, wherein the
injection of the fuel takes place by means of a common rail
injection system which has a common preliminary storage device
for storing highly pressurized fuel and fuel injectors connected
with the common preliminary storage device by way of injection
lines, for injecting fuel into the cylinders of the internal-
combustion engine and a control unit for controlling the fuel
quantity fed to the cylinders for the injection, the controlling
of the injection of the fuel quantity fed to the at least one

Serial No.

second cylinder being carried out by the control unit independently of the injection of the fuel quantity fed to the first cylinders.

37. (NEW) Method according to Claim 16, wherein the injection of the fuel takes place by means of a common rail injection system which, for each fuel injector, has an individual storage device for storing highly pressurized fuel, the individual storage device being connected by way of a distributor line with a common supply line, and has a control unit for controlling the fuel quantity fed to the cylinders for the injection, the controlling of the injection of the fuel quantity fed to the at least one second cylinder by the control unit taking place independently of the injection of the fuel quantity fed to the first cylinders.

38. (NEW) Method according to Claim 17, wherein the injection of the fuel takes place by means of a common rail injection system which, for each fuel injector, has an individual storage device for storing highly pressurized fuel, the individual storage device being connected by way of a distributor line with a common supply line, and has a control unit for controlling the fuel quantity fed to the cylinders for the injection, the controlling of the injection of the fuel quantity fed to the at least one second cylinder ~~by~~ the control unit

09763650-060101

Serial No.

taking place independently of the injection of the fuel quantity fed to the first cylinders.

6
097636954060101
A
39. (NEW) Method according to Claim 18, wherein the injection of the fuel takes place by means of a common rail injection system which, for each fuel injector, has an individual storage device for storing highly pressurized fuel, the individual storage device being connected by way of a distributor line with a common supply line, and has a control unit for controlling the fuel quantity fed to the cylinders for the injection, the controlling of the injection of the fuel quantity fed to the at least one second cylinder by the control unit taking place independently of the injection of the fuel quantity fed to the first cylinders.

0
40. (NEW) Method according to Claim 16, wherein the engine has one second cylinder.

6
41. (NEW) Method according to Claim 40, wherein the engine has five first cylinders.

42. (NEW) Internal-combustion engine which has a plurality of first cylinders and at least one second cylinder, which at least one second cylinder is used as an input cylinder in that

Serial No.

a portion of the exhaust gas therefrom is fed to the carbureted gas by way of an exhaust gas recirculating system,

10~
wherein an injection system is provided for injecting fuel into the first cylinders and into the at least one second cylinder, the injection system permitting a mutually independent controlling of the injected fuel quantity of the first cylinders and of the at least one second cylinder.

09763699
A
101099101
43. (NEW) Internal-combustion engine according to Claim 42, wherein the injection system of the internal-combustion engine is constructed as a common rail injection system, which has a common preliminary storage device for storing highly pressurized fuel, and fuel injectors connected by way of injection lines with the common preliminary storage device for injecting the fuel into the cylinders of the internal-combustion engine, as well as a control unit for controlling the injection of the fuel quantity fed to the cylinders, the control unit being constructed for controlling the injection of the fuel quantity fed to the at least one second cylinder independently of the injection of the fuel quantity fed to the first cylinders.

44. (NEW) Internal-combustion engine according to Claim 42, wherein the injection system comprises fuel injectors, individual storage devices for storing highly pressurized fuel, distributor lines and a common supply line and a control unit,

Serial No.

wherein an individual storage device is assigned to each fuel injector, the individual storage device being connected by way of a respective distributor line with the common supply line, and

wherein the control unit is constructed such that a controlling of the injection of the fuel quantity fed to the at least one second cylinder takes place independently of the injection of the fuel quantity fed to the first cylinders.

45. (NEW) Internal-combustion engine according to Claim 42, wherein for controlling the injection of the fuel quantity injected into the at least one second cylinder and the injection of the fuel quantity injected into the first cylinders, at least one sensor is provided which, for feeding their output signals are coupled with the control unit, said at least one sensor including at least one of:

- (i) a pressure sensor in the cylinder,
 - (ii) a gas concentration sensor for exhaust gas constituents,
 - (iii) a temperature sensor in the exhaust gas pipe train,
 - (iv) a torque sensor,
 - (v) a fuel flow rate sensor,
 - (vi) a pressure sensor for the supercharging pressure,
- and

Serial No.

(vii) a rotational speed sensor on the crankshaft.

46. (NEW) Internal-combustion engine according to Claim 43, wherein for controlling the injection of the fuel quantity injected into the at least one second cylinder and the injection of the fuel quantity injected into the first cylinders, at least one sensor is provided which, for feeding their output signals are coupled with the control unit, said at least one sensor including at least one of:

- (i) a pressure sensor in the cylinder,
- (ii) a gas concentration sensor for exhaust gas constituents,
- (iii) a temperature sensor in the exhaust gas pipe train,
- (iv) a torque sensor,
- (v) a fuel flow rate sensor,
- (vi) a pressure sensor for the supercharging pressure, and
- (vii) a rotational speed sensor on the crankshaft.

47. (NEW) Internal-combustion engine according to Claim 44, wherein for controlling the injection of the fuel quantity injected into the at least one second cylinder and the injection of the fuel quantity injected into the first cylinders, at least one sensor is provided which, for feeding their output signals